Population trends, breeding biology and nesting success of the endangered Mariana Crow or Aga on Rota, Mariana Islands

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Rota

- **Home to 2 of world's most critically endangered birds**

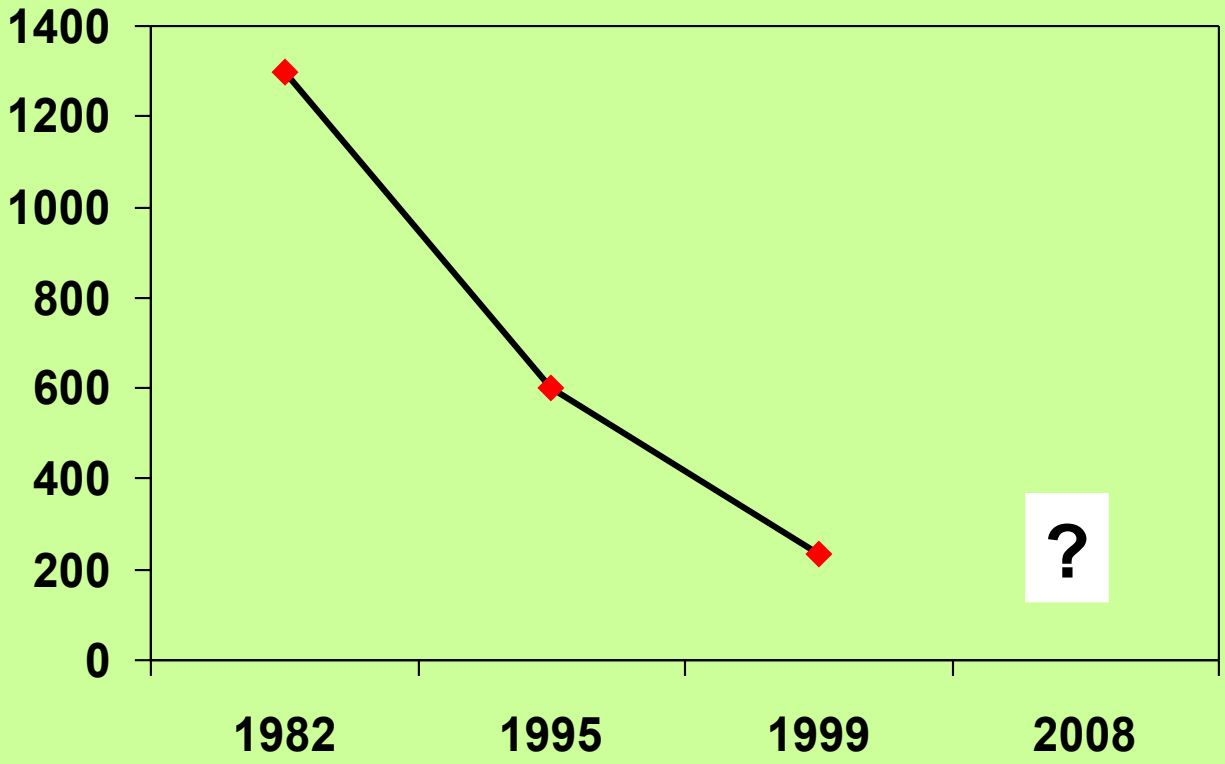
Rota White-eye

Mariana Crow

Mariana Crow

- Only corvid in Micronesia
- Native to Rota and Guam
- Declared federally endangered in 1984
- Extirpated from Guam
- Rota population declining

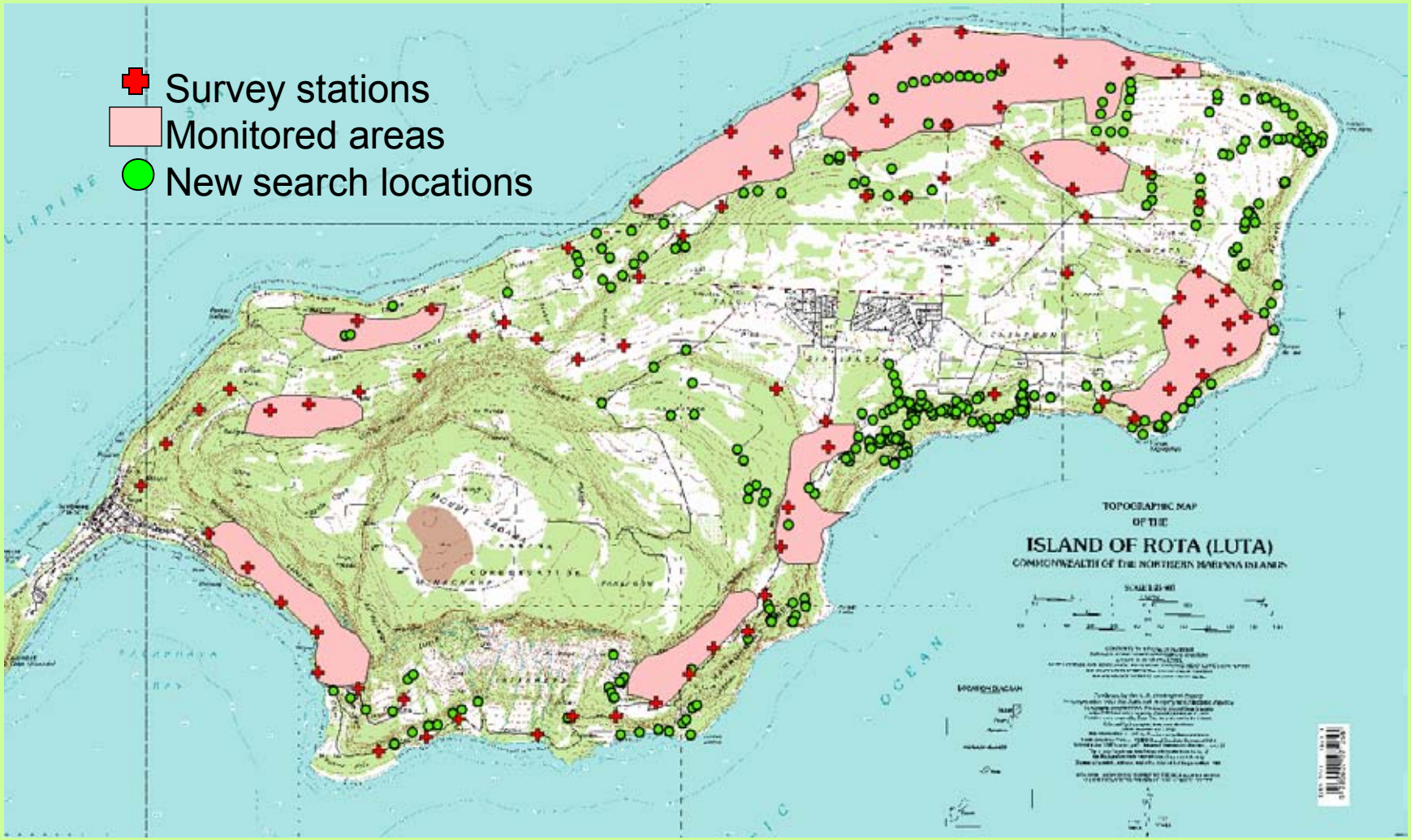
Population trend 1982-2008



2007-8 Crow Pair Count

- Quarterly crow surveys at 86 stations
- Intensively monitored known pairs and recorded new pairs in existing study areas
- Covered unsearched areas

Search areas



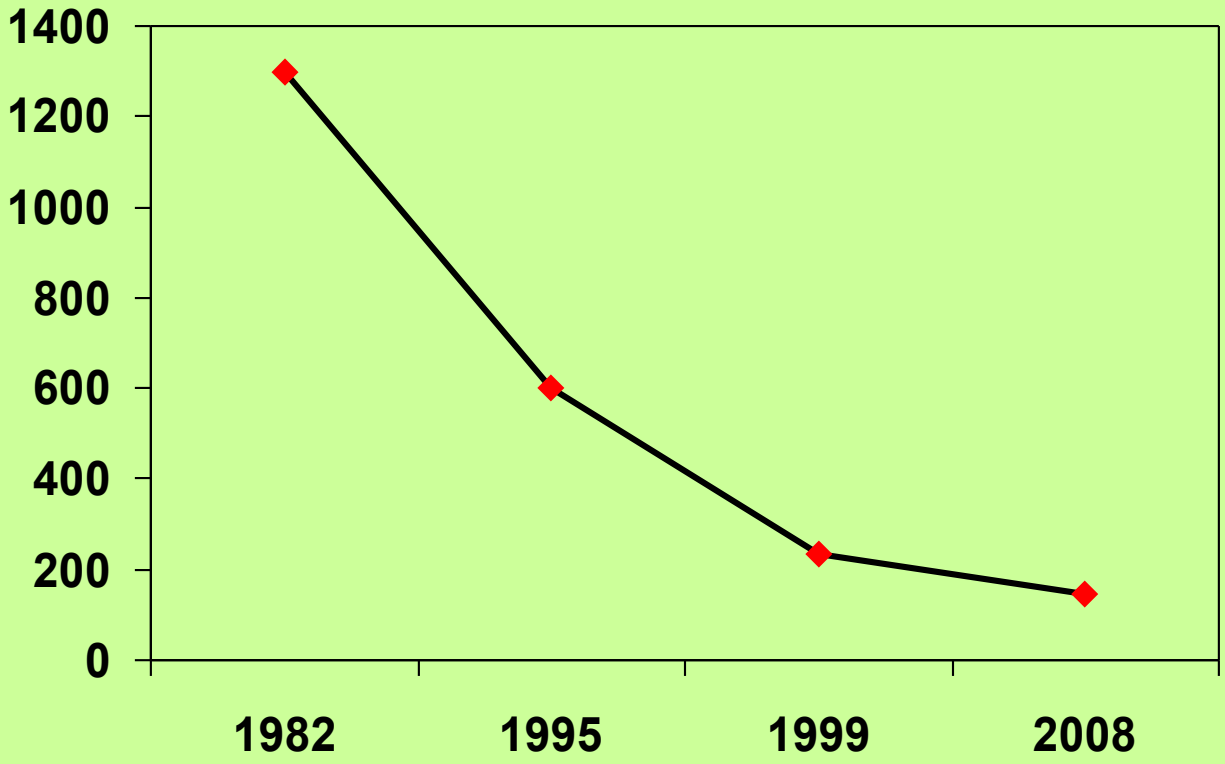
Territorial pairs 2008

▲ 60 breeding pairs and ● 24 unpaired birds

1999 and 2008 territorial pairs

★1999 and ▲2008 territorial crow pairs

Population trend 1982-2008



Possible causes of decline

- Habitat loss and change
  - typhoons
  - clearing for agriculture
  - fires
  - developments
- Human persecution
- Problems with reproduction
  - inbreeding (infertility)
  - nest predation

Objectives

- Life history attributes, nest success, renesting and fecundity
- Spatial and temporal trends in breeding success
- Causes of nest failure

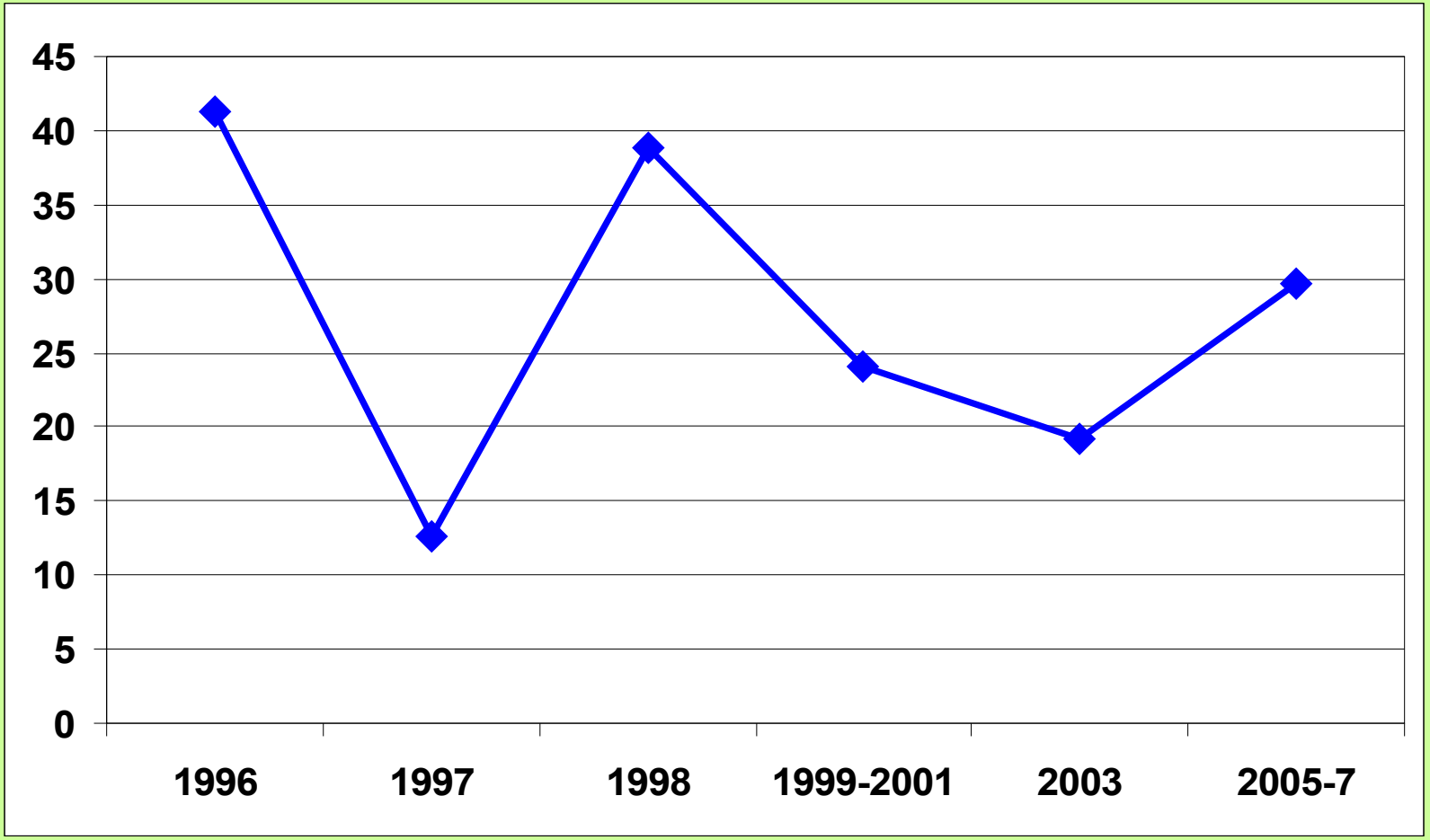
Nest success 1996-2007

- 169 nests monitored
- 2 failed – human
- 9 failed - typhoon
- 12 translocated
- 77 failed – other
- 15 unknown
- 55 succeeded
  - 32.5% apparent or 28.5% Mayfield nest success estimate)

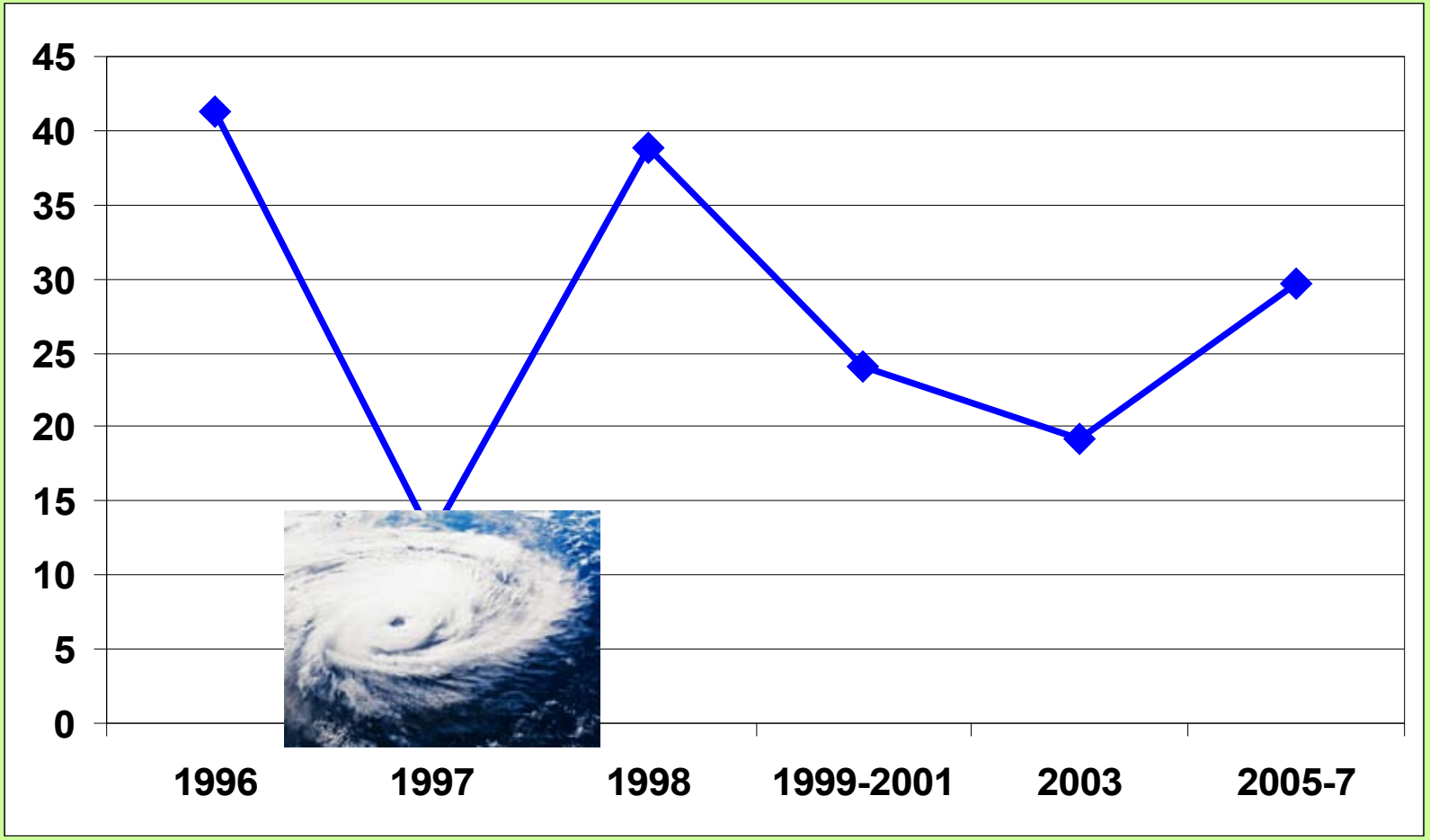
Annual fecundity

Year	No. pairs	No. fledglings	Fledglings/ pair
1996	30	21	0.70
1997	28	4	0.13
1998	28	23	0.82
2007	22	12	0.54
1996-2007	108	60	0.56

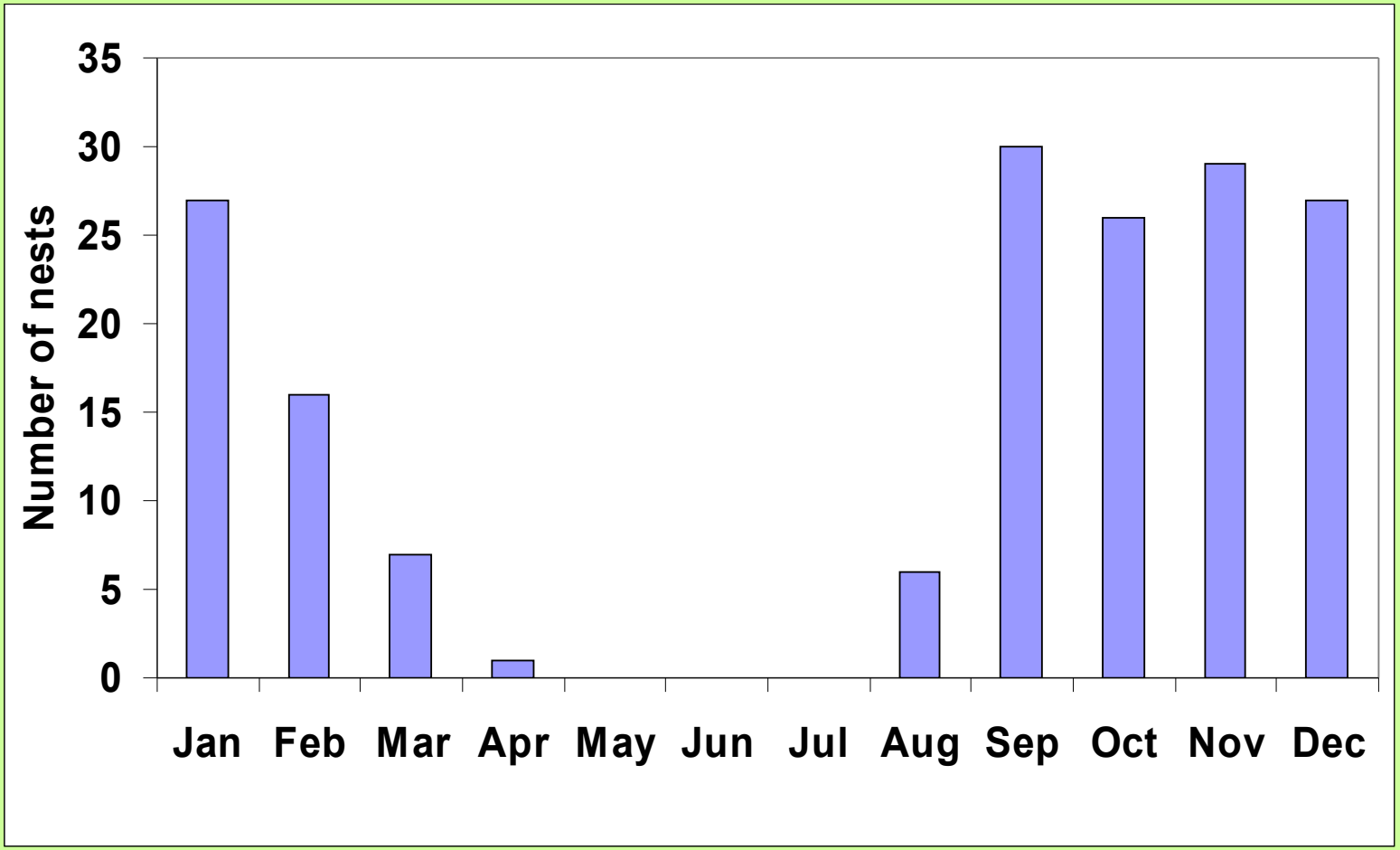
Mayfield nest success by year



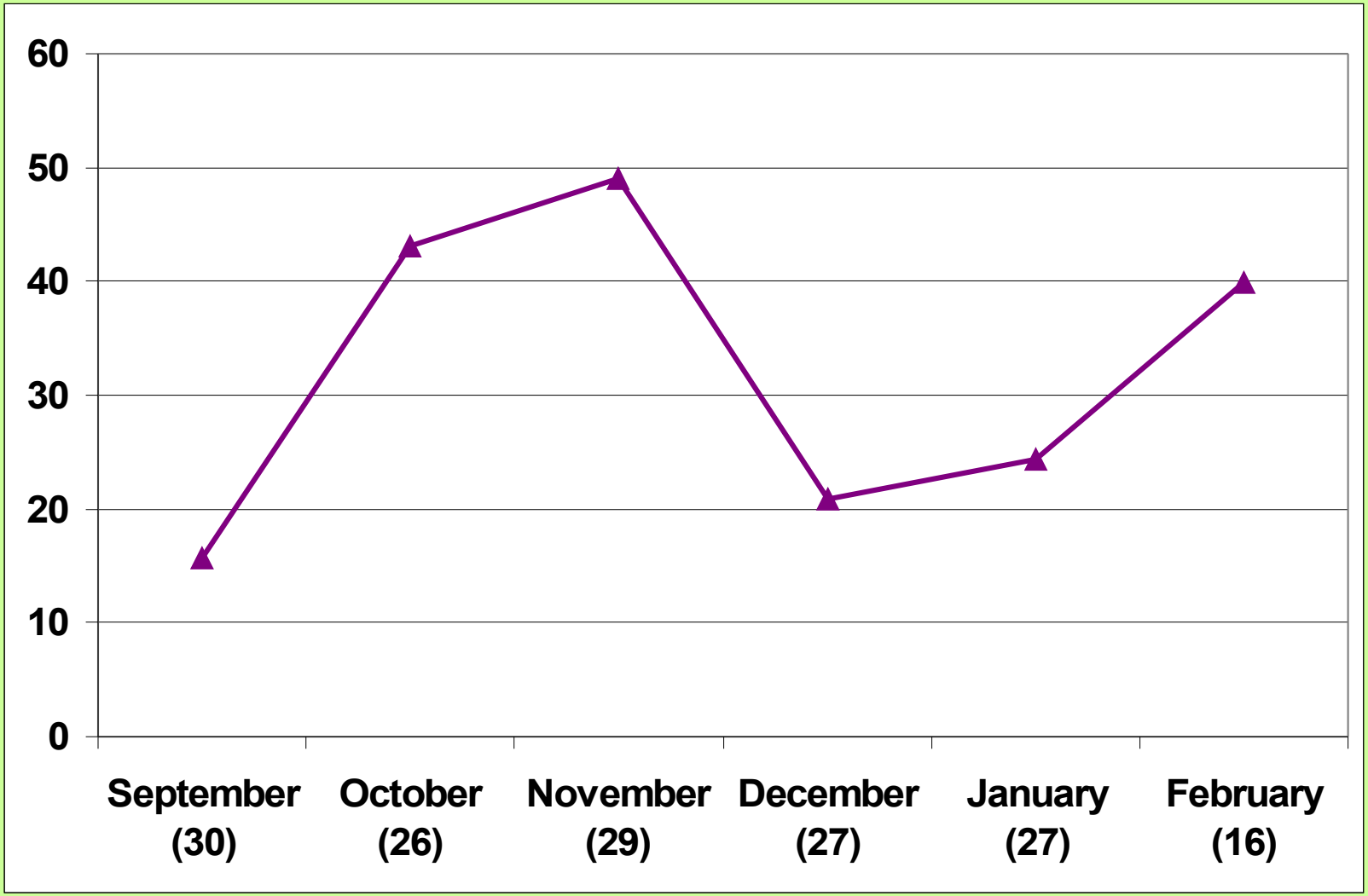
Mayfield nest success by year



Clutch initiation by month



Nest success and month



Life-history attributes

Clutch size	2.59	n = 81
Brood size	1.42	n = 85
No. fledglings per successful nest	1.27	n = 52
Maximum number of nests attempts per year	3	n = 128
Maximum number of successful nests per year	1*	n = 128

Life-history attributes

% of pairs that nest in a season	72%	n = 108
% of pairs that nest successfully in a season	36%	n = 108
Mean number fledglings per pair per year	0.56	n = 108

Life-history attributes

- % pairs that renest after failure:
  - Aug-Oct = 19.8%
  - Nov-Feb = 6.2%
- Renesting interval = 40.1 days (n = 34)
  - Renesting interval Aug-Oct = 33.3 days (n = 16)
  - Renesting interval Nov-Feb = 46.2 days (n = 18)

Nest success by area

Resort area

- Resort area: 36% nest failures chicks found sick/dead (n = 11)
- Rest of island: 0% chicks found sick/dead (n = 77)

Nest filming

- Sony 30 GB hard drive digital camera DCR-SR42, 40x zoom, 8 hours recording time
- Waterproof housing covered in camouflage tape
- Set up at dawn, took down in afternoon
- Cameras placed 20-30m from nest

Crow nest filming

- 7 nests filmed in 2007 season
- 4 nests successful, 3 failed
- Mayfield nest success rate: filmed 49.4%, not filmed 28.0%
- Causes of failure: Mariana crow (2), Micronesian starling (1)

Stealth cam

- 2003 and 2005: Still camera with infra-red motion detector fixed on fake crow nest
- Crow nest baited with chicken/quail eggs
- Results – Mariana Crow, rat

Results: 2003

Results: 2005

Summary

- Population steadily decreasing since 1982
- Disappearance not uniform across island
- Crows nest almost year-round
- Crow nesting successs sensitive to catastrophic events
- Slow life history attributes: low rates of nest attempts, low nest success rates, low egg hatching rate, slow at renesting, low rates of renesting = slow recovery rates
- Nest failures caused by typhoons, crows, starlings, possibly rats, infertility, disease/toxins?

Research and management implications

- Continue to monitor population trend
- Minimize human disturbance to breeding habitat
- Study specific habitat requirements and response to habitat changes
- Continue studying causes of nest failure
- Investigate causes of egg hatching failure and chick deaths
- If nests are to be harvested – take partial not full clutches. Take only before end September
- Investigate causes of juvenile and adult mortality

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